

# The National Security Imperative for U.S. Civilian Nuclear Energy Policy

By Ernest J. Moniz

Question: What do mitigating the global security challenges posed by climate change, the Nation's nuclear navy, our role in worldwide nuclear non-proliferation, U.S. competitiveness in a global marketplace, and the security and reliability of the U.S. nuclear stockpile have in common?

Answer: a robust domestic nuclear energy industry and supply chain.

This was the subject of [my speech](#) to the Center for Strategic and International Studies (CSIS) in October, 2016, where I described the problem of the nuclear industry at a crossroads and laid out eight issue areas to be addressed. The eight issues spanned the entire nuclear energy landscape including the continued operation of existing nuclear fleet, several pathways for new nuclear reactor development and deployment, and the nuclear fuel cycle including waste management and non-proliferation. My thesis was that these issues were inexorably linked, and progress in all of these dimensions required near term actions.

Since that time, the U.S. nuclear power industry has receded into an even more precarious state. Since that speech, 3 more existing nuclear power plant units have been identified for closure before the end of their current operating licenses; the construction of 4 new light water reactor nuclear plants in the Southeast U.S. have been challenged by the ongoing saga of the Westinghouse bankruptcy; and the Trump budget proposals for Fiscal Year 2018 severely cut back R&D and pre-deployment activities for advancing light water reactor technology as well as developing the next generation of advanced nuclear reactor technologies.

Most of the recent nuclear policy discussions have focused on sustaining the current fleet of 99 commercial nuclear reactors and the implications for carbon emissions. Two states – New York and Illinois – have taken action to establish Zero Emission Credits (ZECs) for existing nuclear power plants in their respective territories; Connecticut and Ohio have been considering similar legislation and there are reports that other states may follow suit.

While the nuclear power option does provide significant value in addressing the climate change issue, the current focus of discussion has not addressed another significant value of nuclear power, namely the national security imperative associated with development and deployment of additional nuclear power facilities in the U.S. and globally.

## The Contribution of U.S. Commercial Nuclear Power to Global Security

Nuclear power development is a critical factor in global security. U.S. national security is enhanced if the public and private sectors work in tandem to shape the global spread of nuclear energy consistent with energy security, safety, environmental stewardship and geopolitical stability.

An underappreciated element is the essential role of a strong U.S. nuclear industry to provide continuing U.S. leadership in the international nonproliferation regime. U.S. leadership in the nonproliferation regime (e.g., through its nonproliferation requirements on the transfer of nuclear technology and knowledge) depends on being a valued supplier with a strong and sustainable industry base.

The U.S. position as a valued supplier is rapidly being eroded. The U.S. currently has only four new nuclear reactors under construction, and their fate depends upon resolution of the Westinghouse bankruptcy. This in contrast with robust nuclear expansion programs in China, India, Russia and several other countries and Russia's especially strong commitment to capture significant global market share. In addition to the loss of economic opportunities, this loss of market share will compromise the U.S. leadership role in international non-proliferation regimes.

A world in which Russia and China come to have dominant positions in the global nuclear supply chain will almost certainly see a weakening of requirements, just as nuclear technology and materials spread to many countries.

Many retired generals and admirals have for years emphasized the importance of minimizing climate change and maximizing international energy security for U.S. national security reasons. Their principal concern is destabilizing and dislocating populations, providing breeding grounds for terrorism that the U.S. military may eventually need to address. Nuclear power may expand in many parts of the world to address these climate and energy security concerns, but this expansion needs strong safety, security and nonproliferation norms. US engagement in the nuclear supply chain is essential.

### **The Need for a Vibrant Domestic Nuclear Supply Chain to Serve Both Commercial and National Defense Requirements**

The capabilities we need to support our national security requirements have weakened as our nuclear power supply chain faces a static or declining domestic market. In some cases, we do not have capabilities that will be essential for our nuclear propulsion and weapons missions, and options for rebuilding these will be severely limited unless the nuclear energy enterprise is maintained in the immediate future and strengthened

The U.S. Navy currently operates nearly 100 nuclear power plants on its submarines, aircraft carriers and training/research prototypes. Modernization of the carrier and submarine fleets requires new reactors supplied by U.S. industry with indigenous designs. This direct connection between Navy requirements and nuclear power needs to be articulated and understood more broadly.

Nuclear powered aircraft carriers and submarines are central to the blue water capability of the U.S. Navy to project global power. The nuclear Navy will eventually need additional domestically-produced high enriched uranium to fuel its reactors in the future. Also, the nuclear weapons stockpile requires a constant source of tritium (half-life about 12.5 years), produced in US power reactors. Because of international nonproliferation norms, the supply chain must be entirely domestic and today the U.S. cannot meet these national security enrichment needs. This requirement will be much more difficult and costly to satisfy absent a strong domestic nuclear fuel market.

### **Creating a robust pipeline of trained nuclear scientists, engineers and technicians**

Finally, there is a strong national security interest to sustain a well-trained domestic nuclear workforce to serve both civilian and national nuclear security missions. Outstanding nuclear scientists and engineers are the bedrock of our nuclear capabilities, including U.S. nationals specifically for addressing national security needs.

Replenishing the ranks of nuclear scientists and engineers ultimately rests on having a vibrant nuclear enterprise that promises sustained interesting work. Currently, around 30 universities have nuclear engineering departments, compared with 66 when nuclear power plant construction was robust.

The number of U.S. nationals in these programs, declined significantly until opportunities were envisioned in the “nuclear Renaissance” of a decade ago. This is important because citizenship is required for high-level security clearances. America’s civilian and defense nuclear activity demands highly qualified scientists and engineers, and this need will be difficult to meet without a strong nuclear energy enterprise.

### **Conclusion**

A CSIS report called attention to the national security imperative for [nuclear power in 2013](#). It is time to refresh this perspective with a more detailed and updated analysis of the nuclear – national security nexus that reflects the significant changes and challenges that have arisen in just the last four years.

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